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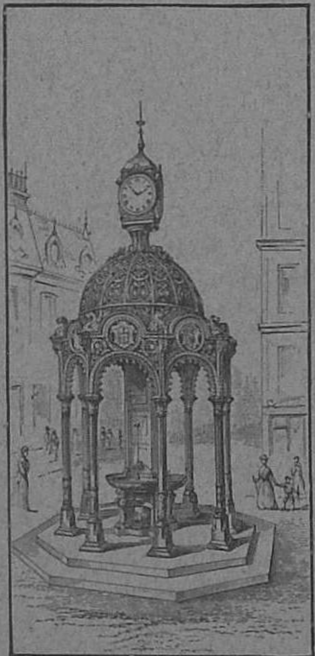

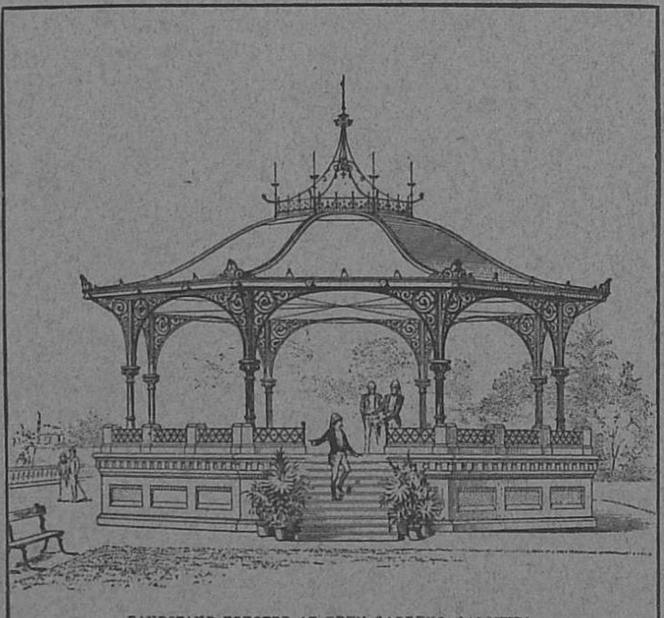

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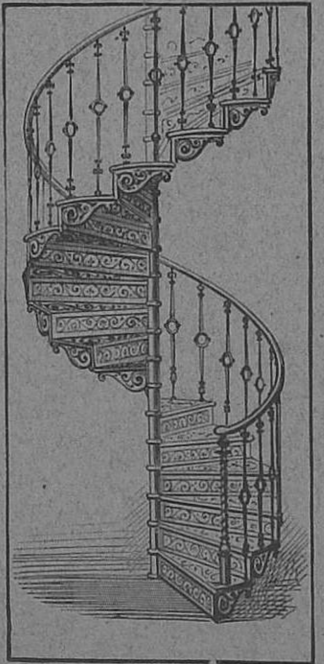

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The Journal of Indian Art.

WOOD MANUFACTURES IN THE PUNJAB.

By M. F. O'DWYER, C.S.

A thoroughly satisfactory account of the wood industries of the Punjab will require a more exhaustive enquiry into the conditions of the trade than has yet been made. Indeed, it may be doubted whether any inquiry conducted within reasonable limits would give results of more than relative accuracy. From the Statistical Returns, however, a general idea of the relative importance of the different branches of the industry may be gathered.

It may be remarked here—1st, that the District Returns are far from uniform in regard to the branches of the industry for which statistics are supplied; 2nd, that, with one or two notable exceptions, the District Reports are strong only in subjects which have been treated already by Messrs. Baden-Powell and Kipling (*Punjab Manufactures*) and the (*Journal of Indian Art*).

The subject will briefly be treated under the following heads:—A. Wood supply, wood-yards, measurements and prices, &c. B. Castes. C. *Tarkhans* and their wages. D. Architectural wood-work. E. Lacquer-work, turnery, and kamangiri. F. Furniture. G. Carriage-building. H. Boat-building. I. Musical instruments.

A.—WOOD SUPPLY.

The question whether the wood supply is likely to continue equal to the demand is too large to be discussed within the limits of this monograph. In brief, it may be said that the process of natural reproduction on the higher ranges is generally satisfactory, and also in the outer ranges, where the growth of seedlings is not interfered with by fires or by grazing. The Forest Department also annually plant or sow a considerable area of land; the total area of plantations being in 1887 about 17,997 acres, a small reserve. Further reserves will be found in the reserved protected forests and the unclassed State forests under the Forest Department:—Reserved forests, 1,551 square miles; protected, 376 square miles; unclassed, 3,272 square miles. Total, 5,199 square miles.

The value of timber, excluding firewood, sold by the Forest Department during the year 1887–88 was ₨.527,000; in 1886–87, ₨.633,000. The average amount annually sold is close on 5 lakhs. Timber is imported largely from Kashmir, the Native States of the Punjab, and the independent territories of Afghanistan. Deodar logs, pine sleepers, scantlings and bamboos are most commonly imported. The extension of railways in the Punjab gave an enormous impetus to the trade. The value of these imports for the four years ending 1886–87 averaged 12½ lakhs of rupees per annum, excluding firewood. The increasing use of steel sleepers has, however, given a check to the demand. The imports in the year 1886–87 were only a little over 10 lakhs, and in 1887–88 were probably still less. Nearly all of this wood is brought down by river from Kashmir and sold at the great central depôts on the Jhelum, Chenab and Ravi. The imports from other provinces is comparatively small. In 1886–87 160,000 maunds were so imported, to which a value of ₨.160,000 is assigned. The imports are chiefly from North-Western Provinces (₨.125,000) and Karachi (₨.18,000). There is practically no export of wood to other countries. The exports to other provinces average 35,000 maunds annually, valued at ₨.35,000. This goes chiefly to Sukkar in Sindh and to stations in the North-Western Provinces.

It appears, therefore, that on the average wood to the value of five lakhs of rupees is sold annually by the Forest Department of the Province, wood to the value of ₨.12½ lakhs is imported from other countries, and 1½ lakhs from other Provinces, giving a total of 19 lakhs. As the exports of wood are insignificant, all this wood may be said to be worked up in the Province. In addition to this must be reckoned the value of the wood cut and sold within the Province by private persons, Public Boards, &c. Of this there is no record; but, estimating its value as 16 lakhs of rupees, we get the total value of the wood annually worked up within the Province as 35 lakhs. No doubt the greater portion of the imported wood is taken by the Railway and Public Works Departments for sleepers and building purposes; and the introduction of steel sleepers for the Railway and of iron rails for roofing purposes will tend in future years to considerably diminish their demand.

The increased demand of wood of late years for railway and building purposes, with the consequent increase of the supply, has naturally increased the number of dealers—wholesale and retail. This class is found chiefly at the great depôts on the Punjab rivers, where the timber imported from Kashmir and other foreign territories by river is stocked, viž., Jhelum, Wazirabad, Phillour, &c., and also at the sale depôts of the Forest Department. The information supplied as to their numbers, methods of doing business, scale of profit, &c., is very scanty; but there seems reason for supposing that this special class have got the monopoly of the business into their hands, and this may be one cause of the complaint that wood is getting scarcer and dearer. At all the large depôts wood seems to be as plentiful and cheap as it ever was, and the Forest Department appear to have some difficulty in disposing of their produce, for the value of the unsold timber in their depôts at the end of the year 1887-88 was ₨.295,000 as against ₨.92,000 at the end of the year 1886-87. There is, therefore, no lack of the raw material, and there seems to be no ground for the statement that shisham, &c., are growing scarce and difficult to procure. Were it so, one would expect the prices to be much higher than they are at present. In certain localities, such as Simla and its neighbourhood, all the better class of timber-trees are growing scarce, and the prices are high, but with regard to the Province generally the supply is quite equal to the demand. To this remark an exception must be made in the case of walnut, which *tarkhans* declare is not only scarce, but often is not to be had.

The following are the prices for the more important species of timber, per cubic foot:—Trees of foreign growth—Deodar (*Cedrus deodar*), 12 a. to R.1 - 8 a. (In Government depôts 11 annas per cubic foot for logs less than 12 feet, and 1 anna per every additional foot in length; Chil (*Pinus longifolia*) 6 a. to 12 a.; Kail (*Pinus excelsa*) 6 a. to 12 a.; Khair (*Acacia catechu*) 1 a.; Dhaman (*Grewia oppositifolia*) 6 a.; Kilawa (*Wrightea mollissima*) 8 a. to 12 a.; Chikri (*Buxus sempervirens*) 3 a.; Kahu (wild olive) 2 a. Trees of indigenous growth—Tali or Shisham (*Dalbergia sissu*) 12 a. to R.1 - 8 a.; Tun (*Cedrela tuna*) 12 a. to R.1 - 8 a.; Kikar (*Acacia arabica*) 6 a. to 12 a.; Tut (*Morus laevigata*) 6 a. to 12 a.; Jaman (*Sizygium jambolanum*) 6 a. to 12 a.; Drek [or bakain] (*melia*) 6 a. to 12 a.; Ber (*Zizyphus Jujuba*) 6 a. to 12 a.; Phulai (*Acacia modesta*) 6 a. to 12 a.; Siris (*Acacia speciosa*) 6 a. to 12 a.

In wholesale dealings with the Forest or Public Works Departments the cubic foot is the unit of measurement. It is also employed by petty dealers and carpenters in buying from depôts. *Tarkhans*, in dealing with one another, sell by the tree or the block, and to compute the size they have recourse to the tassu system of measurement. The tassu contains 1,536 cubic inches, and is, therefore, eight-ninths of a cubic foot. The tassu is, however, a multiple of a smaller measure, the tanswansi, 24 of which go to make a tassu and 27 to make a cubic foot. As far as can be gathered from the reports, the tassu does not vary, at least in theory, in different districts.

B.—CASTES.

The *tarkhan* known as *barhai* in the North-Western Province and as *khati* in the eastern plains, is, like the *lohar*, said to be in origin a village menial. The caste is much sub-divided. The total male adult *tarkhan* population may be estimated at one in six, or approximately, 84,668.

C.—TARKHANS AND THEIR WAGES.

The village *tarkhan* is chiefly occupied in the making of agricultural implements or in executing petty repairs. If work of a higher order be given him, perhaps, if not artistic, his work will certainly prove equal to the requirements of his village employers. To better his position, the village *tarkhan* often migrates to seek employment on the Railway, or settles to earn a precarious livelihood in some neighbouring town. This is the extent of his enterprise. A *tarkhan* will, if forbidden to copy European models, work with considerable effect and artistic propriety. But at best his work is spoiled by a certain want of finish. He exhibits a tendency to leave his work crooked in line and unfinished in joints. Work under European supervision in the Railway workshops and under the officers of the Public Works Department has gone some way in checking this tendency, but at the same time it has probably driven out of his head those ideas in the realization of which lay the excellence of his former work.

Native demand for work of high quality is likely to continue to diminish. The Public Works Department have at least done this—they have effected an entire change in the public taste. Now public taste regards the small rooms and the floridity of the old house ornamentation as remnants of its barbaric prime, and turns to the simplicity of the dák bungalow as its model of perfection. Simplicity is no doubt to be desired, but plain doors with frames of different sizes, windows and doors that would not shut, or if once shut refuse to open—characteristics of the average *tarkhan's* work,—do not go well with a severe simplicity, which, to be tolerable, must be perfect as regards joinery and finish.

While the native demand will diminish, the European market with the opening of Railways is yearly becoming more accessible. There is no reason why Punjab wood-work, which is at the same time artistic and portable, should not find a ready market in Europe. Recent exhibitions have shown that specimens of Punjab wood-work are bought with avidity in England, and some impulse has no doubt thus been given to the trade. Two wood-carvers from Bhera are now employed in London by the Kensington School of Art. Their expenses to England were paid, and they receive a regular salary of Rs.90 per mensem. Probably artisans have also gone from other districts. This new development is due to the good offices of Mr. Kipling, who has done so much to bring the handiwork under the notice of the public, and to help the artisans to find a market. But if the *tarkhans* are left to themselves it is not probable that the stimulus will have more than a passing effect. The rise of the export trade will necessarily be slow; the difference in business habits, the unfailing want of punctuality in fulfilling orders, &c., must long act as hindrances, but these hindrances are not insuperable.

With regard to the present scale of wages in the Punjab, it may be remarked that wages for skilled labour is highest near the great centres, towns or cantonments, and in the frontier districts; the Peshawar and Dera Ghazi being exceptionally high.

D.—ARCHITECTURAL WOOD-WORK.

It has frequently been remarked that the distinguishing feature of the industrial arts of the Punjab is their Muhammadan character. The remark is specially applicable to wood-carving. To quote the words of Mr. Kipling in the *Journal of Indian Art*:—

"The Hindu fantasy of design which is so noticeable in other parts of the Empire, even in objects applied to Muhammadan uses, here finds expression only in a few rude sculptures and pictures, usually from hill districts, and are entirely absent from the buildings of the plains. The sculptures that once decorated the Gandhara monasteries in the Eusafzai country on the Peshawar Frontier are exceptions; for in an artistic sense they are the most complete of any in India. But they belong to a time with which nothing now in existence in the Province has any connection, and they are the work of a race which has apparently left no other traces of its art, manners, or faith. The Sikhs were making a beginning towards a free Hindu modification of Muhammadan motives in architecture and decoration, and had already accomplished something, when they were overtaken by the English occupation. Their wood-carving has a character of its own, their foliage is elaborately lined and twisted, and small and grotesque

figures, human and animal, inadmissible in Moslem work, were beginning to appear. But the essential characteristics of what may be called the official style—such as flatness of relief, absence of under-cutting, the free use of geometrical diapers incised in line merely in relief or in framed lattice-work, and the late Mughal pillar, pilastic or mehrab,—were retained even by the Sikhs. In the hill temples made of wood (of which there are good examples near Simla), the familiar Hindu form of square pillar, chamfered or fluted into octagonal or circular shapes, and crowned by bracketed capitals,—the elements of a form highly elaborated in wood in Gujrat and in stone throughout a vast extent of India Proper,—is common enough, but it is scarcely ever seen in the Punjab plains, where a meagre square abacus crowns a lotus-shaped capital, and while it supports the lintel receives in its groved side a thin cusped mehrab or spandrel."

Little has been done in the Punjab in the way of carving small articles, *e.g.*, caskets, panels, trays, &c.—objects suitable for exportation. It is on large architectural surfaces that the best design is found. Recent exhibitions have drawn the attention of artists to this species of work, remarkable both for its quality and its cheapness. The result has been, while to a small extent increasing the demand, greatly to raise the prices: and this tendency to unreasonably raise the price to European purchasers is one of the great hindrances to the extension of the trade.

Wood-carving is carried on in every district, and every large town has its master craftsmen. Bhera, Amritsar, Batala, Chiniot, Hoshiarpur, and Hissar, have a provincial reputation. But in none can the trade be said to be thriving. Local demand will probably continue to diminish, and the export trade under the most favourable conditions can increase but slowly. Did wood-carvers form a separate craft they would be badly off indeed, but such is not the case; any ordinary *tarkhan* will turn out carved work of some artistic value. Mr. Kipling traces the secret of this widespread facility to the training which all carpenters receive in their youth. They go to work when very young, employ the leisure left them from helping their master or father in carving ornaments in relief on spare pieces of board, beginning with the dog-tooth notching that used to be popular in English artistic furniture thirty years since. From this they are promoted to foliated mouldings and diapers, and taught to draw the pillar in all its parts and the mehrab.

There are many workmen who do not keep up their ornamental practice, but all learn some patterns; and those who are gifted with a feeling for design have with this constant practice acquired a crispness of touch and a surety of execution which is of the first importance in wood-cutting, which "to be done well should be done at once."

The subjects in the descriptive portion of this section will be taken in the following order:—(i) Doors and doorways; (ii) Balconies; (iii) Pinjra, or lattice-work. The door-frame (*chaukat*) consists of lintel, jambs (*baju*), and sill, ordinarily constructed of separate beams. The shape is in most cases rectangular, the height being to the breadth as 3 to 2 or $7\frac{1}{2}$ to 5. The door itself has two leaves turning on pivots instead of hinges, the joining of the leaves being covered by a raised parting bead (*bini*), which is always elaborately carved. The leaves of the door are divided into panels, which are sometimes carved, sometimes plated with perforated metal (*jharas*—Hissar), or left plain and studded with star or shield-shaped metal bosses. The bands separating the panels are often, at least in the older work, carved in a deeply cut running pattern, which withdraws the attention from the monotonous regularity of the panelling, while at the same time it adds greatly to the richness of the general effect. In most modern work it is the *bini*, or parting bead, and the *chaukrat* that receive the most attention. The forms of ornamentation are mainly arabesques; sometimes, however, conventional leaves and flowers of grotesque animal forms are introduced. The patterns followed are by no means new; the designs now in vogue are nearly all to be found in the older work. In the large panels above the carved lintel, it is the custom to introduce mythological figures with Ganesha or Shiva in some one of his numerous incarnations in the centre. In Muhammadan work, of course, the central panel is left plain, or is cut in some geometric pattern, or is fitted with an inscription. Frequently the doorway is surmounted by a second lintel (*toda* or *shatiridar*—Hissar) carved in a similar pattern to those below, but differing slightly both in proportion and form.

In the Hoshiarpur District the wood-carvers have something more than a mere local celebrity; the wood chiefly used is deodar, a wood which, owing to the ease with which it is worked, is fast taking the place of shishem. At Ratya, a small Sikh village in the Hissar District, admirable work, from an artistic point of view, is turned out. The workmen (Hindu) came originally from Sunam in the Patiala territory, a place celebrated for its wood-workers. There is much variety in their work, and their experiments in new designs, &c., are sometimes most successful. The adaptation of the irregular form of the *toda* or second lintel to the construction of the door-frame is the leading feature of the Ratya carving. The door-frame is not rectangular as it is elsewhere. Wings of wood-work cross from the lintel to each of the jambs at an angle of about 45° to each, and the line of these transverse pieces is broken and relieved from uniformity by a variety of ingenious devices, among which the use of birds, which appear as flying caryatides, is peculiarly happy. It should be here mentioned that the Municipal Committee of Amritsar, in order to encourage the art of wood-carving, has started a school in the city, where technical instruction is given. This is an example which other well-to-do Municipalities—Lahore, Delhi and Peshawar—would do well to imitate.

The work done at Chiniot is perhaps the most refined as well as the most artistic carving executed in the Punjab, but detailed statistics, showing the economic state of the industry, are not available.

The Bhera work, and the point in which it differs from that of Chiniot, are thus described by Mr. Kipling:—"The Bhera work differs from that of Chiniot, in that the projectures are flatter,—pilasters and other details being often merely indicated in relief instead of a half or quarter section being imposed,—and the whole of the surface is completely covered with boldly outlined forms of foliage and geometric diaper made out, for the most part, with a V section cut. There is something rude and almost barbaric in this direct and simple mode of execution; but,

though there is no attempt at high finish, the general design and proportions are so good, and the decorative scheme is so full and complete, that the technical imperfection of the work, as carving, is scarcely noticed." The industry at Bhera, which some years ago was decaying, is now very flourishing; the revival of the trade being due to the Indian Exhibition of 1885-86, where some samples of the Bhera work were awarded prizes, and sold so well, that two of the artisans were induced to take up their residence in London, where they still ply their trade. The other workers at Bhera now turn out a regular supply for the English markets.

Pinjra, or lattice-work, like the other form of wood-carving, is essentially Muhammadan in origin. Mr. Kipling says:—"Geometric tracery is a constant element in all Muhammadan designs, and it is applied to carpentry and wood-work as well as to carved or inlaid marble or decorative painting. The Punjab manj or pinjra work is similar to the lattice-work seen in Cairene 'moucharabichs,' while the geometric framed work in relief made for ceilings is almost identical with the ceilings of Cairo. The Arab variety, which has the lattice bars in turned balls and over lattice-wrought forms is, however, unknown in the Punjab. Panels wrought into these forms have great decorative value in a composition of light and shade in wood-carving, from their effect of richness and repose."

The pinjra is usually made of shishem. It may consist of as many as 2,000 separate pieces: these are joined together by a process of dowelling without the assistance of glue, the whole being held together by the frame. This species of work is very lasting, and, contrary to probabilities, the lattice-work holds together even after the frame has been broken or destroyed. "These geometric patterns are also cut in relief, and sometimes incised in deep line, but seldom perforated like the grilles inserted in pianoforte fronts." Pinjra work is carried on at all the great centres, but only at Chiniot and at Peshawar is the work specially remarkable. At both these places the demand has diminished greatly, and will probably continue to do so. A panel of well-worked lattice 3 feet by 1½ feet will cost as much as Rs.13, or somewhat over Rs.3 per square foot. Pinjri work is exported from Peshawar to Kabul, it is said, in considerable quantities.

E,—LACQUER-WORK, TURNERY, AND KAMANGIRI.

The *kharadi* (turner) is found in every town and large village. His work is to be seen in every villager's house. Much of his work is crude in design and colour, and rough in execution, but it improves *pari passu* with the increase in refinement and wealth of the purchasing public: thus the manufactures of the city turners are in general better in quality than those of his village brother.

The turner's instruments are rough and primitive, and are mainly country-made. In common with the rest of the *tarkhan* class, however, he is slowly finding out the merits of English steel, and one frequently finds that his chisels, saws and files are of English manufacture:—(1) The lathe *adda*) consists of two iron bars (*killa*), one fixed in the ground, the other to be adjusted for distance. On the inner side of each bar is a spike, to which the block of wood to be turned (*mochha*) is attached. Between this block and the adjusting bar and over the spike is fixed a cylindrical peg (*chari*), round which the thong of the bow (*kaman*) is once passed. The bow is worked backwards and forwards, and thus imparts the necessary rotatory motion. (2) *Nan, nihan,* heavy chisels for the operation of rough clearing the wood. (3) *Mathna,* a light chisel. (4) *Addi,* the rest for the chisel. (5) *Buraki,* a pointed chisel for grooving. (6) *Sathra* and *sathri*, narrow-edged chisels of sizes. (7) *Churna, rachi, roda,* an iron bar, ends flat bladed, and edges sharp for separating the cylinders, &c. (8) *Bomkinja* or *patra* for cleaning out the insides of vessels to be turned hollow. (9) *Tesha,* the adze. (10) *Varma,* the drill. (11) (*Ari*) saws and files (*reti*). (12) *Rangata,* the polishing stick, &c. The woods used are shishem and poplar.

After the articles have been turned to the required shape on the lathe, the colour is applied by pressing sticks (*batti*) of coloured lac to the revolving surface. Sometimes two or three colours are laid on in patches to produce a mottled or marble ground (Dera Ismail Khan). Borders are usually made in two or three colours superposed, and the pattern is etched with a chisel. When colours are superposed, the invariable order is first red, second green, and third black. The coating of colour is rendered even by means of the polishing stick, a piece of bamboo, or the midriff of a palm leaf. To produce a pattern in green the black is scraped through, for red both the green and black are scraped away, and for white the wood itself is exposed. The lac stands well the extreme heat of the sun and the damp of the rains, but cannot be compared in these qualities to Japanese lacquer-work.

The colours are mostly mineral. Yellow is made with orpiment, green is the arsenite of copper, red with red-lead or vermilion, blue with *lajward* or Prussian blue, black with lamp-black. The usual method of manufacture is as follows:—Yellow.—Quarter seer shellac and 2 chitaks sulphide of arsenic (*hartal*); pound the latter in a mortar, mix the shellac in, and warming gently, mount the mixture on a stick, cool, and take off the pigment and roll it into a cylinder (*batti*). Red.—Quarter seer shellac and 2½ chitaks of vermilion; treat with water and pound for several hours, dry and mix with shellac and proceed as for yellow. Green.—One chitak yellow; warm and mix one tola of indigo and proceed as before. Black.—Quarter seer shellac and 2 chitaks lamp-black, &c. Blue.—Quarter seer shellac and 2 chitaks carbonate of lead; pound and mix indigo, &c. *Lajward.*—Quarter seer shellac, 2 chitaks white lead, and 4 tolas bottle colour (*ajaib rang*); warm shellac gently, mix the two other ingredients slowly, &c.

The following places may be regarded as centres of the trade:—Sahiwal (Shahpur District), Dera Ismail Khan, Pakpattan (Montgomery), Ferozepore, Hoshiarpur, and Jullundur. Sahiwal lacquer-work, as compared with that of other centres, is rough and crude. It is, however, characterized by great freedom in design. Aniline dyes are much used, an aniline mauve being peculiarly unpleasant. The work done in two colours is most effective. The Dera Ismail Khan work is unique in character, very few colours are employed, and the pattern is usually of fern-like scrolls of almost incredible minuteness and delicacy of execution, mostly wrought or scratched by women. The caskets, tables, &c., are lavishly ornamented with ivory studs, flowers and similar ornaments. Pakpattan

articles are remarkable for solidity of surface and design. At Ferozepore, the work of an old pupil of the Mayo School of Art is skilful in execution and artistic in design. He uses the farash (*Tamarix orientalis*), and not, as elsewhere, the shishem and poplar. His work is the best of the kind in the Province, but it is very high in price. The Hoshiarpur lacquer-work differs from that of Pakpattan in the use of metallic tin ground under transparent colour, and in addition to the scratched work of colour, figures of a mythological character are boldly painted and covered with transparent lacquer. The brilliance in colour is secured by the use of aniline dyes, which are used to effect the same object at Dera Ismail Khan and at Sahiwal. "Another peculiarity is the scratching of lines of ornament or figures in one colour of lac, and then filling the lines with another colour, the whole surface being made smooth. This is the method followed in Burmah, only the lac is applied on basket-work, and not on wood. Rude figures of divinities are freely introduced, and larger pieces are attempted here than elsewhere. Little care is, however, taken in the selection of the wood."

The *Kamangar's* art is fast becoming a thing of the past. There is no longer a demand for the bow and the quiver, on the decoration of which he used to exhaust the resources of his art, and only here and there is there any demand for surface decoration on wood. The native practice is to cover the ground either with cloth or some fibre, mixing whiting and glue, or, in some cases, to use the fibre for stopping crevices only. Over this sheets of tinfoil are pasted, and on this metallic ground designs are painted in water-colours, some of which, when varnished, are transparent. The varnish, too, is often yellow, and thus such portions of the tinfoil as are left become golden, while transparent blues, &c., are lighted through with a metallic sheen. The work still survives in a fitful fashion. It probably originated from the necessity of closing the pores of wood so as to prevent resinous exudations from blistering the work during the summer heats—a precaution which is only partly successful.

F.—FURNITURE.

The furniture in an ordinary native house is simple in the extreme, consisting only of a bed, a low chair with high back (*pira*), and a stool (*piri*). If the owner be rich there will also be carpets and *masnads*, &c. The houses of the educated classes are furnished more in conformity with European ideas. The making of bed-legs is a very considerable industry, and considerable ingenuity is expended on their decoration. They are turned on the common lathe, and afterwards painted, varnished or lacquered, and ornamented with ivory knobs. The price ranges from 4 annas to Rs.12 a set (for the double pair). The "pira," or chair, and the "piri," or stool, are often elaborately ornamented; the method of manufacture is the same as for bed-legs. Some of the better class are even pretty to look at, and the brilliant colours, chiefly red and yellow, with which they are adorned, certainly lights up the gloom of a native room.

Furniture after the European pattern is made in every district station and in every cantonment. The larger the station the better the prices, and the better the class of workmen. Given a pattern, a very fair imitation will be turned out. Chairs, small tables and *almirahs*, &c., are done well, but large tables are seldom well finished. The best known centres of the trade are Gujrat and Kartarpur in the Jullundur District. Gujrat is chiefly famous for its manufacture of chairs. The trade was started by a former Deputy Commissioner, Mr. Capper, who gave his name to a particular form of camp-chair, and his successors—Colonel Parsons, Colonel Harrington, and Mr. Wilkinson—each introduced different varieties. The trade is now on a permanent and secure footing; and though the Deputy Commissioner reports that the work is deteriorating in quality, owing to heavy competition with outsiders and the paucity in the demand, the Gujrat manufacture is as popular as ever. The annual outturn is about Rs.4,200, of which Rs.2,800 is said to be exported to other districts. The material employed is chiefly shishem, of which there is an abundant supply; and this is probably the reason why the industry has become localised in the district. The prices vary from Rs.24 for the most elaborate form of easy-chair, brass bound and covered with leather, to Rs.3 for the ordinary. Camp-chairs and good dining-room and office chairs cost Rs.6. The Kartarpur industry is similar to that of Gujrat, except that the artisans are Hindus, while in Gujrat they are Musalmans. Fifty-two men are occupied in the manufacture of arm-chairs, tables, desks and office-boxes, the annual outturn of which is estimated at Rs.7,300. At Simla a trade in furniture carved in walnut-wood has grown up of late years. The workmen are mostly Sikhs from the adjacent plains. The fret-saw cutting, which once enjoyed a slight popularity in Europe, is imitated, and Swiss brackets, clocks, &c., carved in wood, have furnished some models. Very good furniture is also turned out at Hoshiarpur, but the prices are high.

The inlaid-work is also of Muhammadan origin, and was probably introduced from Arabia. In the Punjab the chief centres are Hoshiarpur, and Chiniot in Jhang. The wood inlay-work of Hoshiarpur has a high provincial reputation, and is capable of indefinite extension. The extension of this trade to articles of European use is mainly due to the efforts of Mr. Coldstream, C.S. For many years "qalamdans" or pen-cases, walking staves, mirror-cases, and the low *chouki* or octagonal table common in the Punjab, and probably of Arab introduction, have been made here in shishem wood and inlaid with ivory and brass. The patterns were very minute, and covered nearly the whole of the surface with an equal spottiness. Mr. Coldstream procured its application to tables, cabinets and other objects, and during recent years a trade has sprung up which seems likely to grow to still larger proportions. It is probable that in future the most profitable field for the Hoshiarpur inlayers will be, not so much in the production of finished articles for European uses,—in the devising of which the native workman is obviously placed at a great disadvantage by his complete ignorance of Western usages,—but in the production of panels and details to be afterwards worked up by European cabinet-makers. The fault of the inlays is a certain triviality and insignificance of design, and its too equal and minute distribution. At various times some of the inlayers have visited Lahore, and have been shown at the School of Arts examples of good Arabic and Indian design, and they have been furnished with sketches. When the blackness and ugliness of an Indian village are considered, it is really matter for surprise that decorative invention survives in any form. An effort is now being made by one of the leading London firms of importers to introduce the Hoshiarpur inlay more fully to the best

market. The ivory used is generally the waste stuff left by the turners of ivory bangles, and is worth from Rs.2 to Rs.4 per seer. It is frequently alleged that bone, especially camel-bone, is used as well as ivory, but both ivory comb-makers and turners make a good deal of waste, which is quite large enough for the small details of the inlay. Black-wood, the old "hearth-wood" (*Diosporos tomentosa*), incorrectly called "abnus" or ebony by the workmen, is used both as a ground and in combination with ivory as an inlaying material, especially in the familiar herring-bone pattern. Brass is also employed, but with less effect; for, when foliated work in small patterns is worked in brass, it is necessary that the metal should have a better surface than it generally receives in the Hoshiarpur work. The brass inlay of Chiniot is superior to that of Hoshiarpur in design and in finish. Here the strips of brass are not, strictly speaking, inlaid, but rather laid on, and are retained in their place by the nails. The slightest warp in the wood is fatal to the effect, for the brass at once bulges up, and is not readily smoothed down again. The designs are strictly of Muhammadan type, such as may be seen in mosques and tombs all over India, and have less originality than the floral combinations invented by the Hindu carpenters of Mainpuri, North-Western Provinces. From Hoshiarpur there is an export trade amounting to over Rs.5,400 annually in inlaid-work. It is chiefly sent to Bombay and Calcutta. Rs.10,000 worth is exported to other districts of the Punjab.

G.—CARRIAGE BUILDING.

The common forms of native carriage-building are as follows:—The bullock-cart (*gari* or *gada*) drawn by two, three or four bullocks; the one-horse cart (*ekka*) and *reri* (for goods); the *baili* or *ekka* drawn by two bullocks; the *rath* used towards Delhi, a *baili* with richly ornamented dome. The woodwork is of ber, kikar, tut and shishem, all heavy and strong woods. Carts are turned out everywhere; *ekkas* at Amritsar and Jandiala, and also in many other large towns. Trade in them is small. In Delhi, *raths* are largely turned out, there being considerable demand for them among Hindus on ceremonial occasions.

European forms are coming into vogue, not only in the large towns, but in the districts also. Those who can afford the cost prefer the easy-running tum-tum or phaeton to the old *ekka* or *rath*. The woods employed are "tut" and "shishem." Native-made English carriages are, in general, clumsily and coarsely made, and, even if elegant in shape, are always found wanting in finish. The axle boxes are always English. The painting or varnishing is done in a very rough way. The average *tarkhan* has no idea of getting a polish on his work. He thinks a couple, or at most three, coats of paint daubed on the carriage quite sufficient for all practical purposes, and he does not allow a sufficient interval between the different coats.

Carriages are turned out in all the large cantonments and cities, but the Lahore work alone is worthy of remark. The best work is done by a European firm in Lahore employing native artisans—Sikhs; but in every large cantonment there are one or two building firms, most of whom also turn out furniture on the European model.

H.—BOAT BUILDING.

Boat-building, which was so important an industry in former years when one of the principal means of communication was by water, has rapidly declined since the extension of railways. Native boats, as a rule, are clumsy in construction and primitive in all their details. They may be classified as follows:—(*a*) *Beri* takes cargo up to 1,000 maunds. These differ only in breath of beam and length. They are used on the Ravi, Chenab, Jhelum and Indus. They are built of "diar" on the Punjab rivers, and of teak on the Indus; at the stern is the cabin for the boatmen. (*b*) *Zarak* on the Sutlej is higher in build than the *beri*, and often has a chupper or booth on the deck for a cabin. (*c*) *Kishti*, punt, with the prow tilted and pointed (made of chil, kikar or deodar). (*d*) Varieties: (1) *Dondi*, the bow makes an angle of 30° with the water, the stern double that angle; (2) *Yourik*; (3) *Dugga*. The sterns and cabin arches are usually ornamented with wood-carving. The decoration is incised and painted bright red, or green or white, which has a pretty effect when seen at a distance.

Boat-building is carried on to a greater or less extent in the following places:—Prang in the Peshawar Division; Attock, Jhelum, Pind Dadan Khan, Khushab, and Wazirabad in the Rawalpindi Division; Lahore in the Lahore Division, Rupar in Umballa; and Muzaffargrah. Prices for large boats, Rs.200 to Rs.600; small boats, Rs.20.

Boats after the European fashion can be made to order at Jhelum, but the workmanship is rough and the cost great. The trade, from the nature of things, is very languishing, as the competition of the the railway is gradually attracting all the carrying trade. The artisans, however, have turned themselves to other branches of carpentering.

I.—MUSICAL INSTRUMENTS, &c.

An elaborate description of the various musical instruments in vogue in the Punjab, with details of their manufacture, &c., will be found in Baden-Powell's *Punjab Manufactures*, page 272. It will be sufficient to give their names here with the English equivalent when possible:—1. *Sarangi* or fiddle; 2. *Tumbura* or guitar; 3. *Sitar*, a variety of No. 2; 4. *King*, one-stringed instrument; 5. *Yaktara*, one-stringed instrument; 6. *Sarod*, six-stringed; 7. *Rabab*, six-stringed; 8. *Bansri*, bamboo flute; 9. *Bin*; 10. *Shurnaos* or bagpipes. The instruments and others which I have not mentioned are made by a special class of artisans. There are generally a few in each district, driving a desultory trade, and only making the instruments to order.

The wood used is *tun* or walnut. The bodies of the instruments are made of the great gourd (*Cucurbita maxima*) and the bottle gourd (*Cucurbita lagenaria*). The prices vary according to the elaborateness of the instrument, and the extent to which it is decorated. The wages are from 6 annas to 8 annas per day. The tools used are those of the ordinary carpenter, but capable of doing smaller and finer work. Of the annual outturn no reliable information is forthcoming. The industry is a scattered and straggling one.

In comb-making more than 500 workmen are employed. Their wages vary from $3\frac{1}{2}$ to 6 annas per day. The manufacture is chiefly carried on at Amritsar, Lahore, Dera Ghazi Khan, and Shahpur. In Amritsar the trade is particularly brisk, owing to the demand for combs among the Sikh community; and 2,880 combs, valued at Rs.75, are said to be turned out daily. The woods used are (*kahu*) wild olive and *chikri*, which are found locally, and the former is also imported from Kalabagh on the Indus, from Jhelum and Rawalpindi, where it sells for 3 maunds per rupee. The only instruments required are a saw, a *lathi*, and cold chisel. A skilful workman can turn out 20 to 30 combs per day. These sell at prices varying from one pice for the ordinary kinds used by men to 2 annas for the more elaborate ones worn by women, which are often silvered over with the substance known as *kallai*. The wages vary from 3 to 5 annas per day The annual outturn is valued at 3 lakhs of rupees per annum. This industry is generally worked by Hindu capitalists, who supply the raw material and dispose of the manufactured articles. The artisans are often hopelessly in debt to them.

Basket-making is a scattered and straggling industry, occupying a large number of the menial classes, not regularly or permanently, but helping them in a desultory way to eke out a subsistence. The number of the workmen is returned as 3,261 but it is probably much more, and their principal castes are Chamars, Sansis, Baharupia, Musalis, and other waifs and strays on the outskirts of society. Baskets of the smaller kind (*tokris*) are made from the cotton plant and from the twigs of the mulberry. The large round baskets known as *kharis* are made from the tall strong grass called *sarkana*, secured by thongs of leather or deer-skin. A very handsome kind is the large painted and box-shaped basket used in native houses to keep clothes and ornaments. These are generally made fast with thongs of leather, and cost as much as Re.1 to Rs.2; they are called *toungs*. In the Simla Bazar, basket-making is carried on as a regular occupation, and 32 hands are permanently employed; they are paid at the rate of 5 annas a day, or rather their earnings come to that sum on the average; the ordinary menials employed on this work do not make more than $1\frac{1}{2}$ to $3\frac{1}{2}$ annas.

The maker of pipe-stems is known as *nechaband*, and is found in every town. The hollow bamboo is used for the stem and mouth, and the hollow reed (*nari*) for the tube which supports the *chillum* or bowl. Delhi and Amritsar are the places where the work is carried to the greatest perfection; the artisans are said to earn 5 to 7 annas per day.

Walking-sticks are made all over the province, the best at Bhera, Pakpattan, Hoshiarpur and Amritsar. The industry is not a special one, being carried on by the Lohars and turners in wood. The sticks are frequently lacquered or ornamented with ivory. Bamboo and wild olive are the woods most commonly used; the latter takes varnish and lacquer best. The walking-sticks made at Bhera are fitted with a crutch of translucent stone resembling jade, said to be imported from Bokhara.

The making of cricketing apparatus, tennis, badminton and cricket bats is an industry which is rapidly growing with the increasing popularity of cricket all over the province. The most important centre of the industry is Sialkot; but in Amritsar, Gujrat and Rawalpindi a trade is gradually springing up owing to the demand. At Sialkot 100 workmen are employed in 30 firms, and turn out tennis, badminton and cricket bats to the value of Rs.15,000 annually, of which Rs.10,000 is exported to other provinces, and Rs.5,000 to the other districts of the Punjab. The trade is a most flourishing one, and the workmen earn 8 and 10 annas a day. The wood employed for the bats is walnut or ash, and for the stumps mulberry. Badminton bats sell from 8 annas to Re.1-8-0, tennis bats from Re.1-8-0 to Rs.4, and cricket bats of seasoned walnut wood from Rs.3 to Rs 6. The Amritsar cricket bats are said to be the best, and there are now two firms in that city which turn out only cricket bats.

Saddle-trees are made in every district, the wood and iron work being executed by the same person. From Mianwali in Bannu, and Pindi Bhattian in Gujranwala, there is an export of these articles to the extent of Rs.500, but the trade must suffer, as saddles of the English pattern displace those of native make. Farash and kikar are the woods most commonly used. The manufacture of camel saddles is carried to greater elaboration in Jhang and the Derajat, where camels are commonly used for riding. The wood employed is shishem; but this represents but a small proportion of the cost, as the saddle is decorated with brass plates covered with delicate tracery, and the wood-work is inlaid with brass. Some of these saddles, which are made to seat two persons, cost as much as Rs.100.

Miscellaneous articles—such as toy-boxes, chessmen, pen-boxes, pencil-boxes, and shuttle-cocks—are made generally throughout the province, and especially in the large cities—Lahore, Amritsar, Delhi and Mooltan—where there is a large and steady demand. They are mostly lacquered or inlaid, and so come within the scope of the lacquer-work, inlay and wood-turning that have been already described. Hoshiarpur and Pakpattan produce the best toys, and from the former city there is a considerable export down country.

GOLDEN TEMPLE AT AMRITSAR, PUNJAB.

By H. H. COLE, Major, R.E.

Reproduced from Major Cole's "Monographs of Ancient Monuments of India."

Amritsar was founded in A.D. 1574 around a sacred tank from which the city takes its name "Pool of Immortality." The site granted by the Emperor Akbar to Ram Dass, the Guru of the Sikhs, became covered with temples and huts and was at first named Ramdaspur, from the founder. He made Amritsar the proper seat of his followers, the centre which should attract their worldly longings for a material bond of union, and the obscure hamlet, with its little pool (General Cunningham tells me there was a village named "Chak" on the site) has grown into a populous city and the great place of pilgrimage of the Sikh people. In A.D. 1756 Prince Timur, the son of Ahmed Shah Durani, expelled the Sikhs from Amritsar, demolished the buildings, and filled the sacred reservoir with the ruins.

In A.D. 1762 the army of the Khalsa assembled at Amritsar, the faithful performed their ablutions in the restored Pool, and the first diet, or Gurumutta, was held. The same year Ahmed Shah destroyed the renewed temples and polluted the tank with the blood of cows. In A.D. 1764 the Sikhs became Masters of Lahore, the chiefs again assembled at Amritsar, proclaimed their own sway, and rebuilt the temples.

In A.D. 1802 Ranjit Singh repaired the principal buildings and roofed the temples with sheets of copper gilt.

The Tank, as it now exists, is about 500 feet square, and fed by the old Hasli Canal. The Golden Temple stands on a platform in the centre, and is approached by a pier, at the end of which is the Darshani Door, or "Gate of Sights." The Tank is surrounded by bangahs, *i.e.*, dwellings for visitors and pilgrims. To the east is a garden with several fountains, called the Guru-ka-Bagh, made in A.D. 1588, and due south of this the Kaulsar Tank, 410 feet by 170 feet. Further east stands the tomb of Baba Atal (built in A.D. 1628). The whole place is full of interest, although so comparatively modern. In repairing the Golden Temple, Ranjit Singh used many of the inlaid decorations and marbles carried away from the tomb of Jahangir and other Muhammadan monuments at Lahore. It is stated in the official list of buildings of interest published by the Punjab Government in 1875 that the design of the temple repaired by Ranjit Singh was borrowed from the shrine of the Muhammadan Saint Mian Mir, near Lahore (1635 A.D.)

At the request of Sir Robert Egerton, the late Lieutenant-Governor, I had a careful survey made of the Tank and buildings. It will therefore be more fitting to postpone a detailed description. The architecture is an adaptation of Muhammadan styles, flavoured with a good deal that is of Hindu tradition. Birds and animals are introduced in the marble mosaics, and mythological scenes are depicted in the paintings of the interiors. A peculiar flat arch is of frequent use in the façades, and seems to have been universal in Sikh buildings and tombs.

The doors of the Darshani Gate are of shisham wood, the front overlaid with silver, the back inlaid with ivory. The silver plated front is ornamented with panels only. The back arranged in square and rectangular panels with geometric and floral designs, in which are introduced birds, lions, tigers, and deer. Some of the ivory inlay is coloured green and red, the effect being extremely harmonious.

In January, 1881, when I first visited Amritsar, I noticed the mosaics to be suffering from dirt and neglect, and recommended their being periodically cleaned and kept from cracking by careful oiling.

The earliest specimen of oriental marquetry that I know occurs in the famous Somnath Gates, now in the Agra Fort. The elaborate Saracenic patterns on them prove that, even if the wood frames were originally in the Somnath Temple, they must have been re-carved by Mahmoud of Ghazni. They date, at all events, from the early part of the eleventh century, and having been recently cleaned are discovered to be really of sandalwood.

Mr. Fergusson writes :—"The carved ornaments on them are so similar to those found at Cairo in the Mosque of Ebn Touloun (A.D. 885) and other buildings of that age, as not only to prove they are of the same date, but also to show how similar were the modes of decoration at these two extremities of the Moslem Empire at the time of their execution."

The wooden mimbar, or pulpit, in the mosque of Qous, Cairo (twelfth century A.D.) and the marquetry in the Mehrab of the mosque of Nesfy Qeyçoum, also at Cairo (fourteenth century A.D.), are inlaid with ivory, the geometrical and floral patterns, which are most elaborate and beautiful, resembling Indian work of the same class.

The doors of the mosque of Khazrete at Samarkhand (the building dates before 1405 A.D., when Tamerlane died) are of wood, inlaid with ivory, in patterns very Indian in design, and, as we know Tamerlane to have been much struck with Indian architecture, when he invaded India in A.D. 1398, and to have carried off Indian workmen from Delhi to Samarkhand, it is probable that examples of marquetry existed there before the fourteenth century.

The earliest existing specimens of Indian marquetry I know are at Ahmedabad and Bijapur. The wooden canopy over Shah Alam's tomb (A.D. 1475) at the former place being handsomely incrusted with mother-of-pearl. The doorways of the Ashar Mahal (A.D. 1580) at the latter place are inlaid with ivory. The canopy over Sheik Salim Chisti's tomb (A.D. 1581) at Fatehpur-Sikri is of wood, covered with tesseræ of mother-of-pearl.

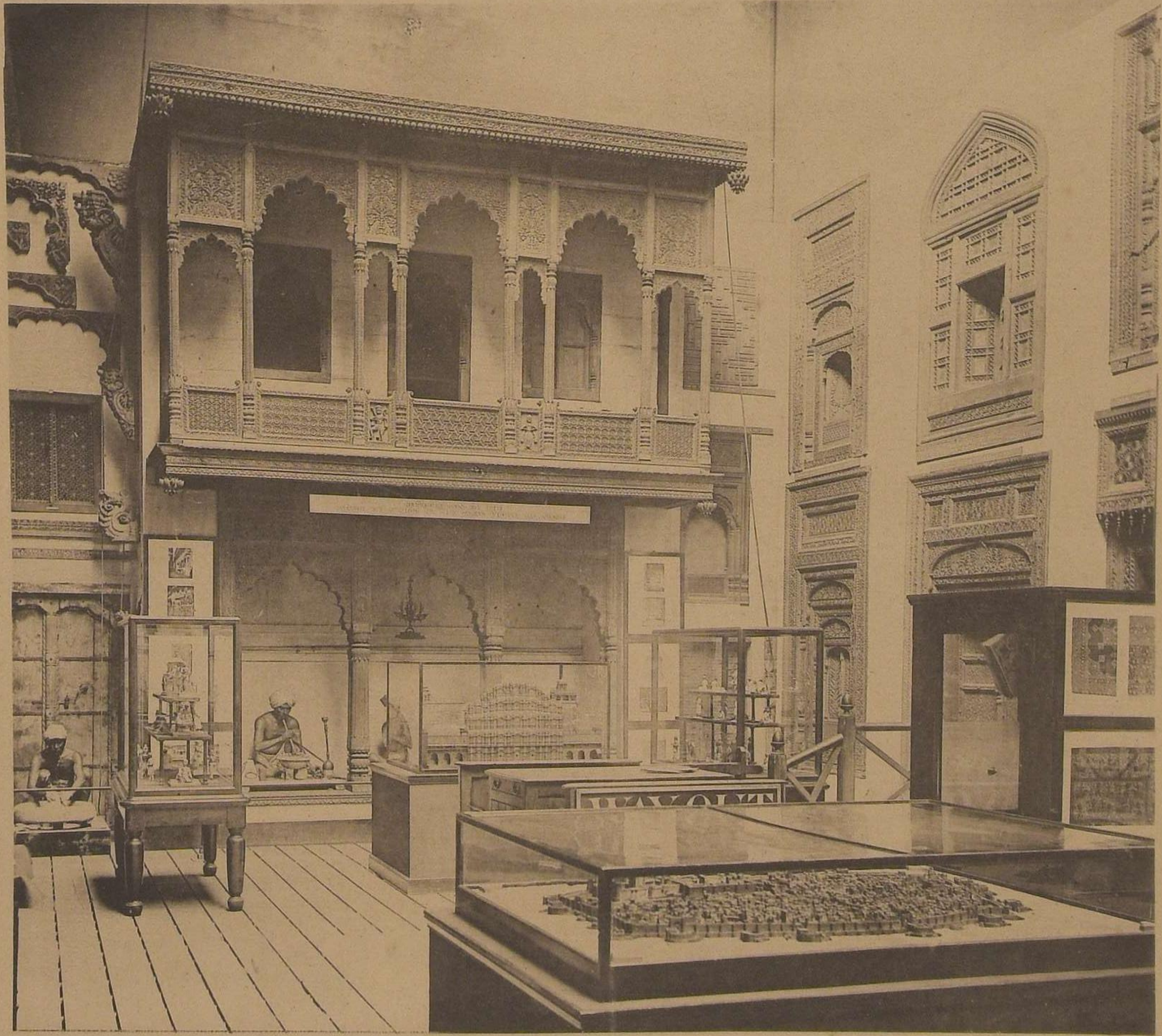
The doorways in the Amber Palace, near Jaipur (A.D. 1630) are of wood, variously ornamented with—(I) Carved panels; (II) Inlays of ivory; (III) And small lozenges of ivory, which are incrusted with what is known as Bombay inlaid work. Unfortunately these doors are very much neglected and falling to ruin. The doors of the Bari Mahal (A.D. 1711) at Udaipur are of another species of marquetry, some being ornamented with small panels of wood overlaid with ivory, like the modern work done at Vizagapatam, only in far better taste.

The inlaid work of Bombay was imported from Shiraz and Persia, and is the least effective of any of the Indian wood inlays, being extremely minute and monotonous in design.

The modern Hoshiarpur work resembles that in the Darshani Gate. It is a promising and rising art manufacture and could derive material for new patterns from the examples above quoted.

LIST OF ILLUSTRATIONS.

Wood Manufactures in the Punjab.—Entrance Vestibule, India Museum, London; Two Doors in Carved Deodar Wood; Two Doors in Carved Shishem Wood; Two Windows in Carved Deodar Wood. The Golden Temple at Amritsar.—Two Double and Three Page Plates of Wood and Ivory Mosaic.

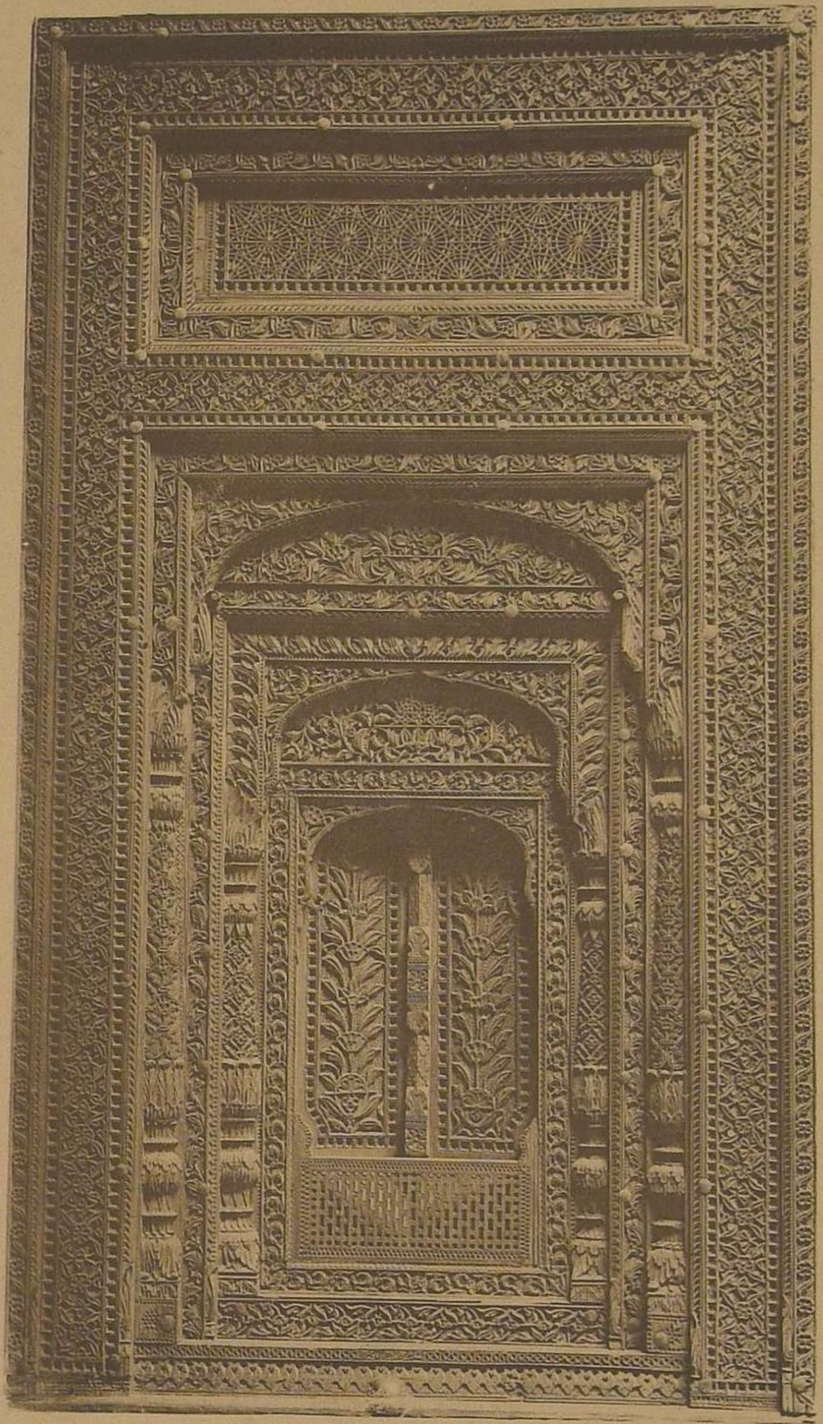


The Indian Section, South Kensington Museum.

North End of the Entrance Vestibule.

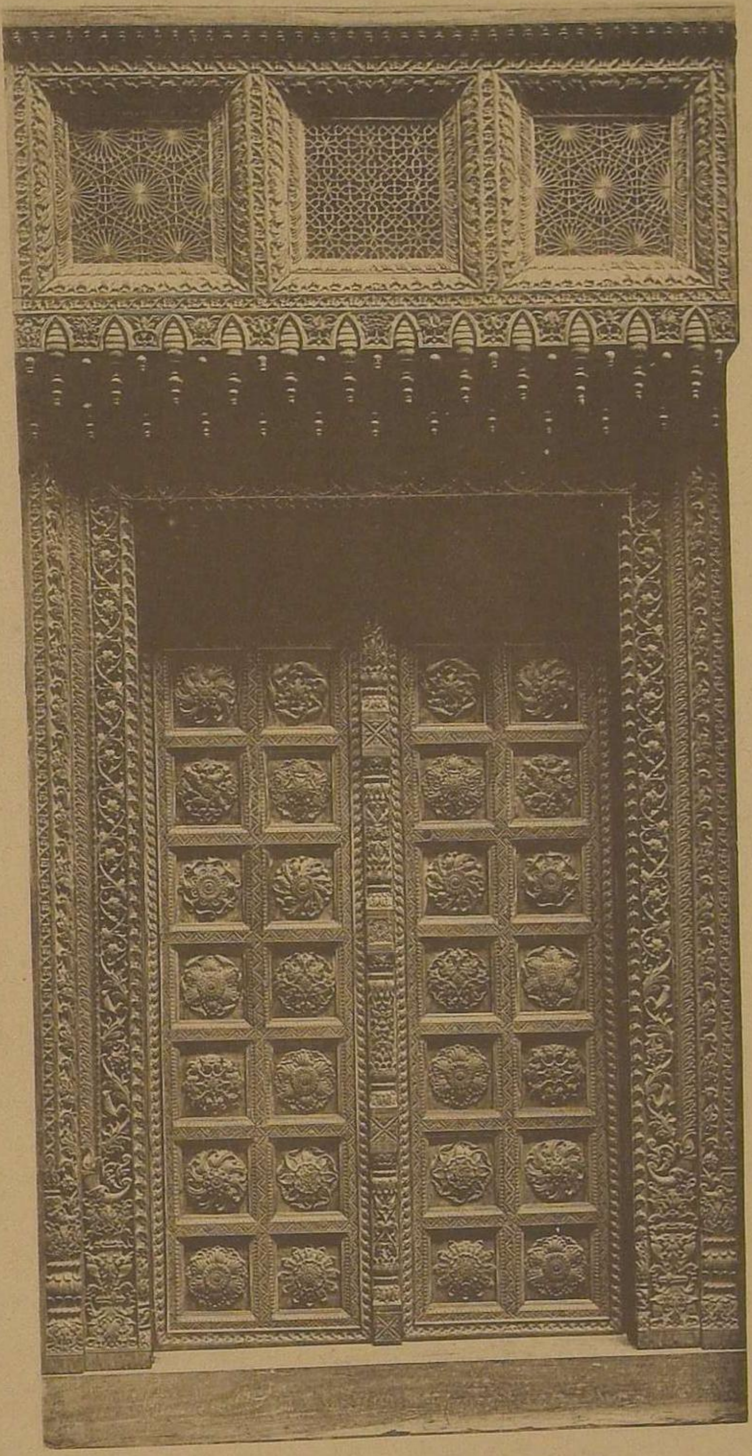
In the centre, a full sized copy of a house and shop in the Bazaar at Cawnpore; on the right hand, carved doors and windows from the Punjab and Kashmir.

Door in Carved Deodar Wood.
Bhera, Shahpur.

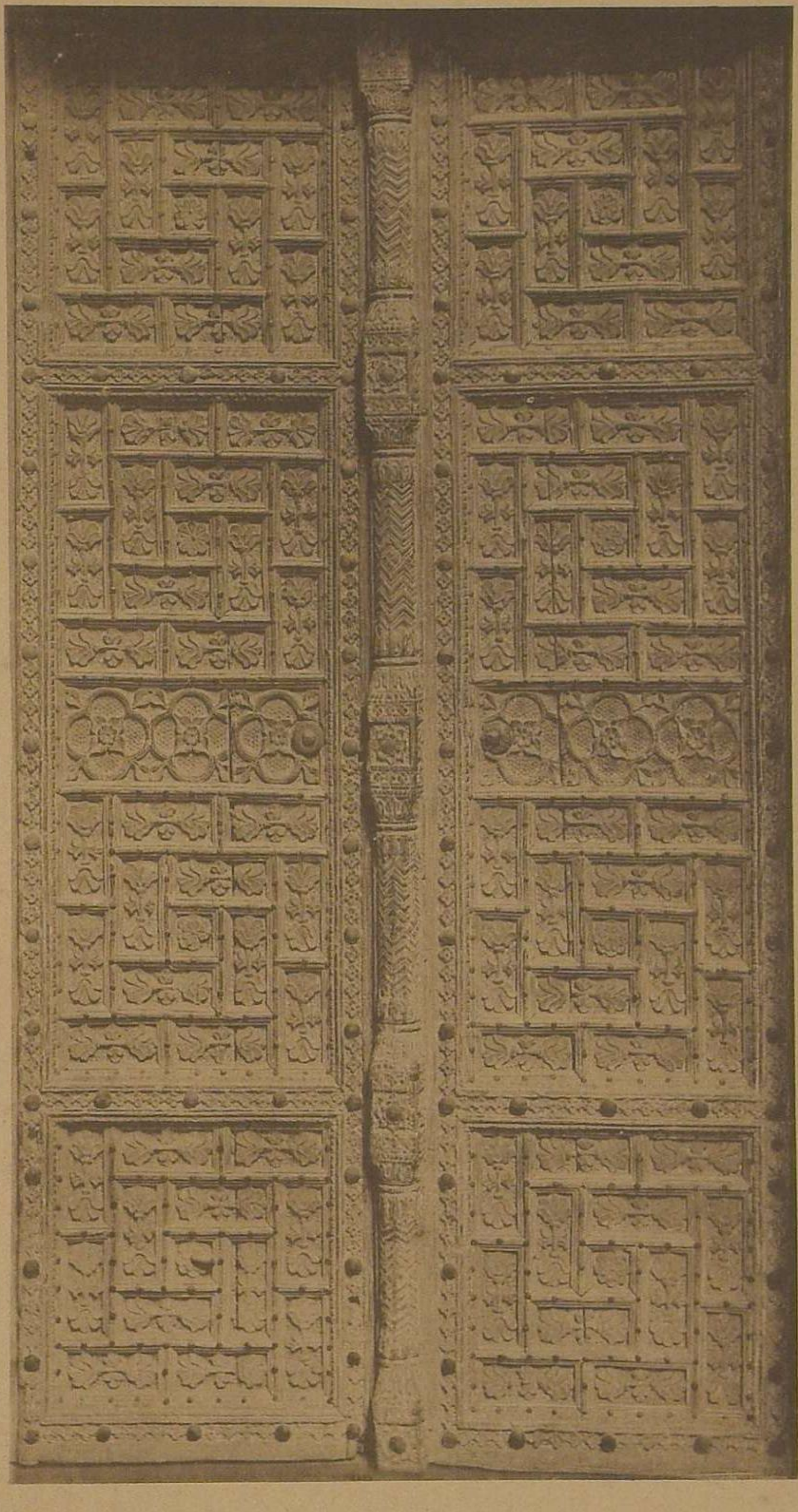


Door in Carved Deodar Wood.

Bhera, Shahpur.

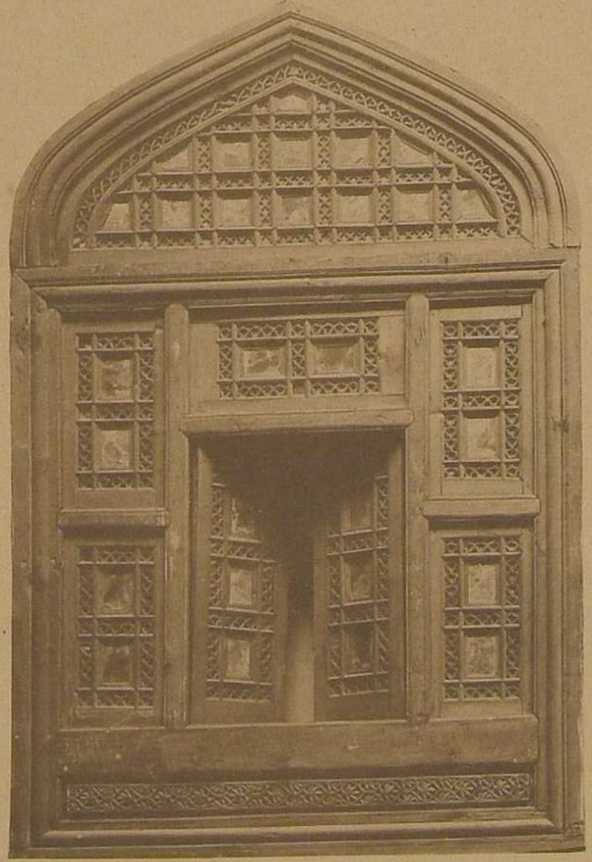


Door in Carved Shishem Wood.
Hoshiapur, Punjab.



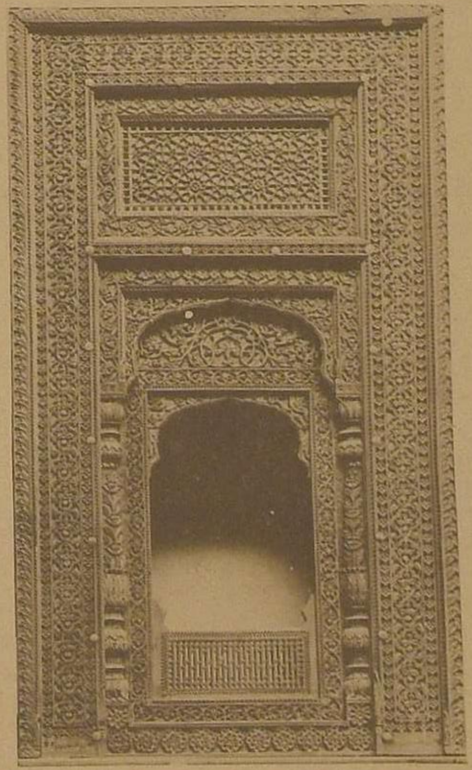
Door in Carved Shishem Wood.

Amritsar, Punjab. 17th Century.



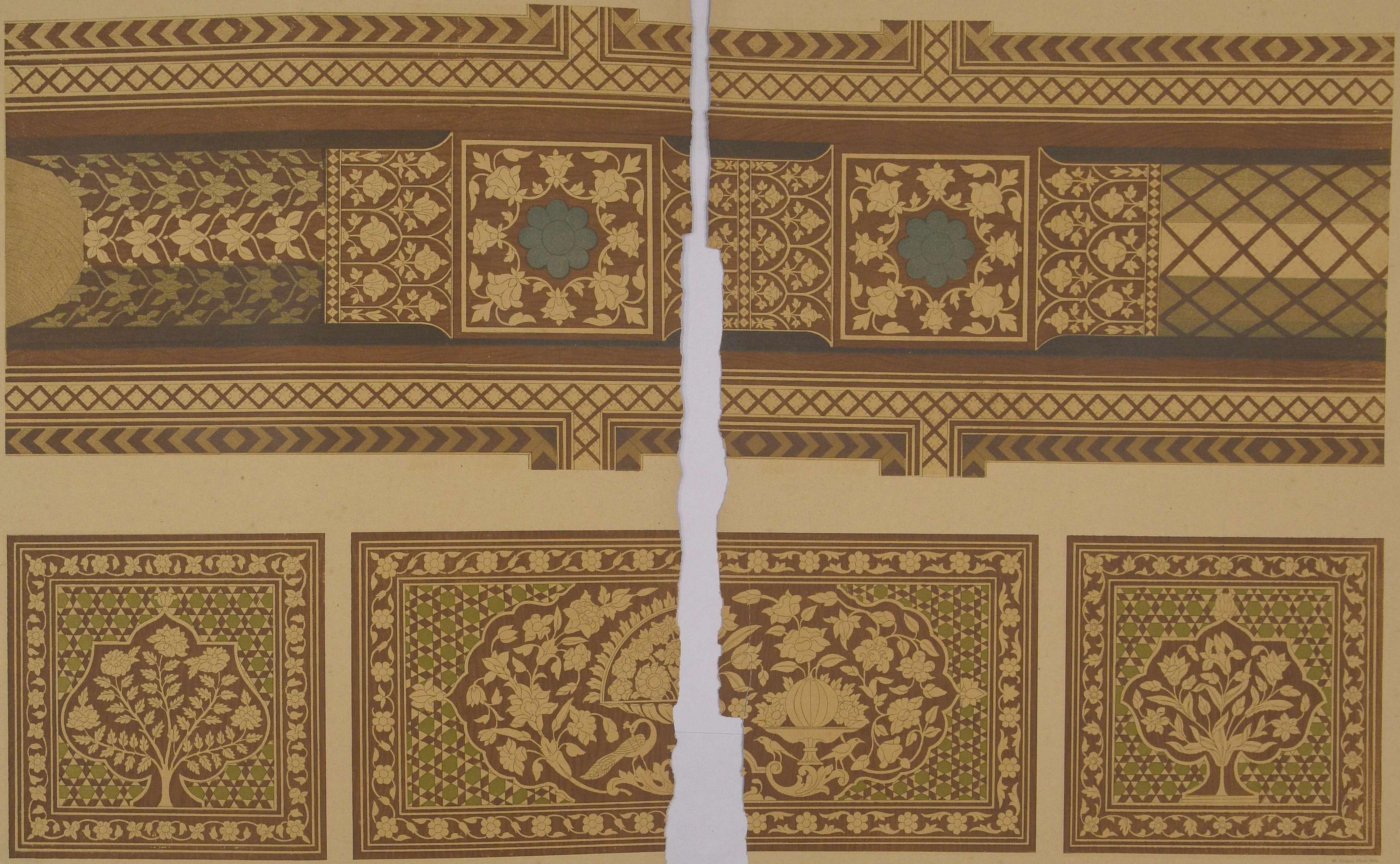
Window in Carved Deodar Wood.

From the Mosque of Shah Hamadan at Srinuggur, Kashmir.



Window in Carved Deodar Wood.

Bhera, Shahpur.



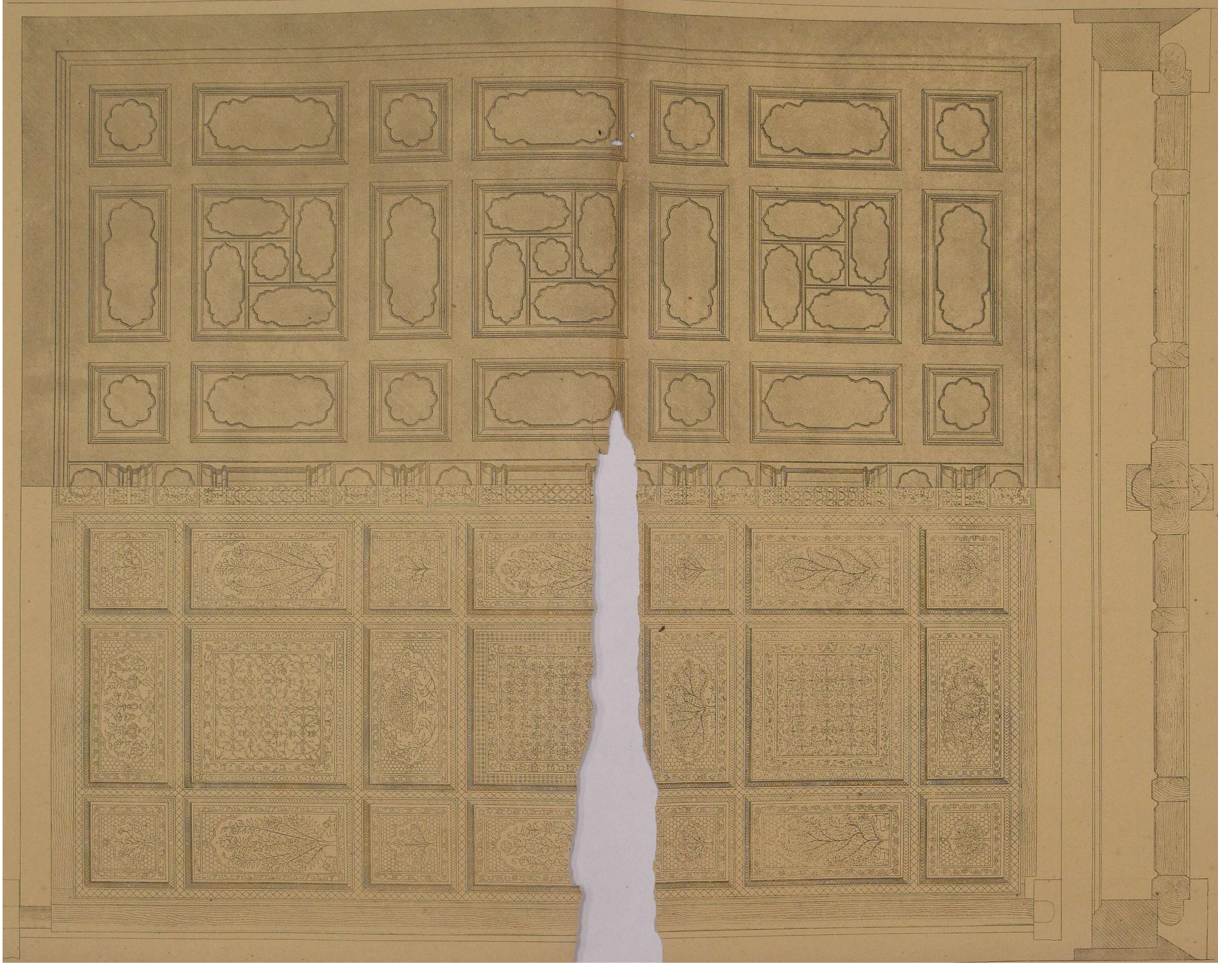
Wood and Ivory Mos [torn] of Amritsar, Punjab.

W. Griggs, Photo-Lith.

Wood and Ivory Mosaic. Golden Temple of Amritsâr, Punjab.

W. Griggs, Photo-lith.

WOOD AND IVORY MOSAIC. Golden Temple of Amritsar, Punjab.



Doors of the Darshani Gate.—Inner and Outer Faces.
Golden Temple of Amritsar, Punjab.

BECK'S

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They are the best form of lens for all enlarging and copying purposes, also for architecture, groups, landscapes, and every description of out-door photography, and can be used with the quickest shutters in the market, giving sharp definition up to the edge of the plate. With the exception mentioned below, the sizes of plates given in list are those for which the Lenses are best suited, with full aperture or large stop, while with moderate or small stops they will cover two or even three sizes larger. The 8¾ in., however, is better suited with full aperture for rapid work for the 6½ in. by 4¾ in. size, while with moderate stop it will cover 8 in. by 5 in. or larger plates.

The back combination of these Lenses can be used singly as an ordinary Landscape Lens of about double the focus. The front Lens having been removed the hood can be screwed into the main tube of the Lens.

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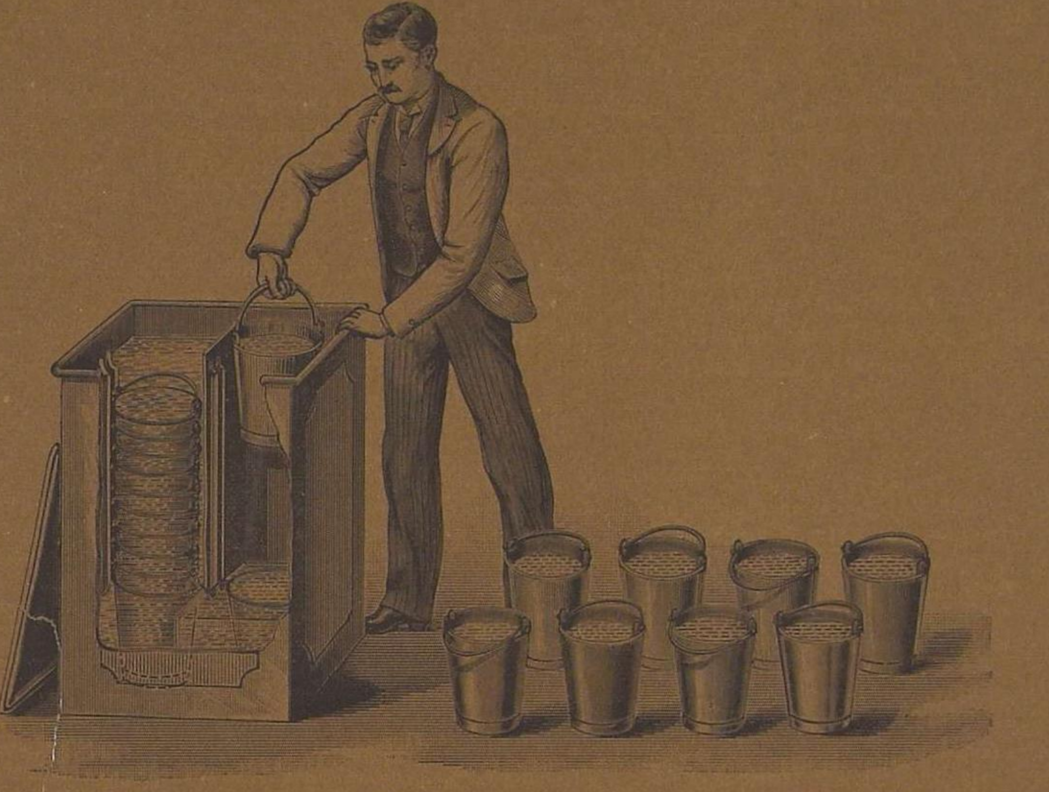

The Patent Bucket Fire-Extinguisher combines the utmost efficiency with extreme simplicity.

It consists of a covered receptacle containing water, in which is submerged a nest of buckets, that can be instantly withdrawn full and ready for use.

Everyone understands the application of a bucket of water for extinguishing fire, and this is the essential feature of the invention—namely, having at immediate command at the outbreak of a fire a large quantity of water—10, 20 or more bucketsful—ready for instant use.

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